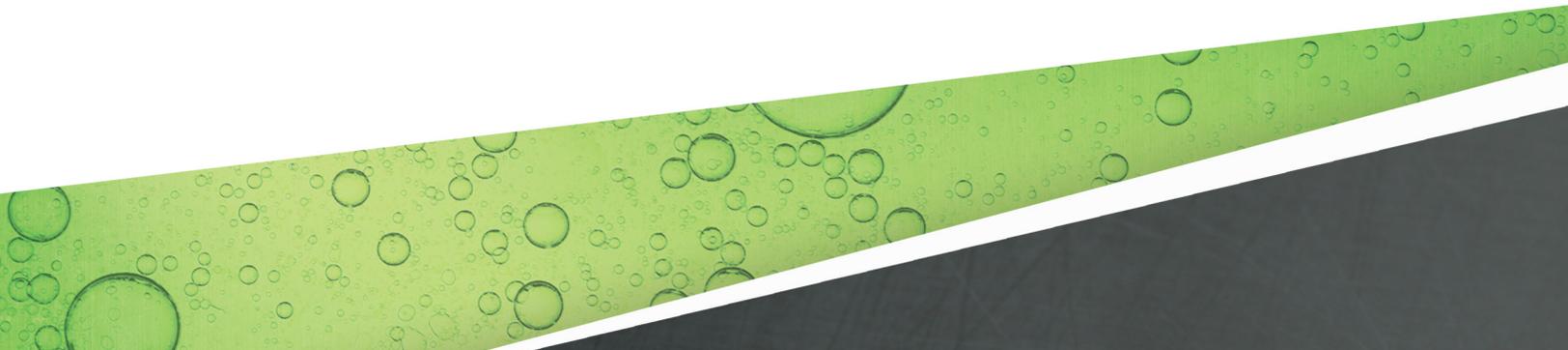


DIESEL EXHAUST FLUID PUMPING ACCESSORIES

INSTALLATION GUIDE



The information in this publication is provided for reference only. While every effort has been made to ensure the reliability and accuracy of the information contained in this manual at the time of printing, we recommend that you refer to

“franklinfueling.com” for the most current version of this manual. All product specifications, as well as the information contained in this publication, are subject to change without notice. Franklin Fueling Systems does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of, or in any way connected with, installation, operation, use, or maintenance by using this manual. Franklin Fueling Systems assumes no responsibility for any infringement of patents or other rights of third parties that may result from use of this manual or the products. We make no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Copyright © 2017 Franklin Fueling Systems, Madison, WI 53718. All world rights reserved. No part of this publication may be stored in a retrieval system, transmitted, or reproduced in any way, including, but not limited to, photocopy, photograph, magnetic, or other record, without the prior written permission of Franklin Fueling Systems.

For assistance, please contact:

Franklin Fueling Systems
3760 Marsh Rd.
Madison, WI 53718
USA

Web: franklinfueling.com

Telephone:

USA and Canada: +1.608.838.8786, +1.800.225.9787

USA and Canada Technical Support: +1.800.984.6266

UK: +44 (0) 1473.243300

Mexico: 001.800.738.7610

France: +33 (0) 1.69.21.41.41

China: +86.10.8565.4566

EZ FIT is a registered trademark of CommScope, Inc.

403414001 r3

Contents

- Introduction1
- Conventions used in this manual1
- Operating precautions2
- Questions and concerns3
- Installing DEF Pumping Accessories5
- Typical DEF-PMA installation6
- 60 Hertz variable-length DEF-STP replacement kits7
- Accessories and repair parts7
- 50 Hertz variable-length DEF-STP replacement kits8
- Accessories and repair parts8
- 60 Hertz fixed-length DEF submersible turbine pump kits.....9
- Accessories and repair parts9
- 50 Hertz fixed-length DEF submersible turbine pump kits.....10
- Accessories and repair parts10

Intentionally Blank

Introduction

Diesel Exhaust Fluid (DEF) is a non-flammable, non-combustible liquid with a specific gravity of 1.09 at 20° C (68° F) and is made according to ISO 22241-1 specifications. It is composed of 32.5% urea and distilled or deionized water. DEF is used in diesel vehicles that are equipped with Selective Catalytic Reduction (SCR) emission control. DEF freezes at -11° C (12° F) and can be impaired by prolonged storage above 25° C (77° F). DEF systems require compatible materials to prevent product contamination / degradation and unintended release.

DEF Pumping Accessories are intended for use only with DEF and in conjunction with DEF Pump Motor Assemblies (PMA) models. DEF-PMA models are suitable for vertical installation where the pump motor is suspended off the bottom of the storage tank by the discharge piping.

DEF-PMA models are rated for continuous operation with motor cooling provided by product flow and protected from dry running. DEF-PMA models require a Bypass Relief Valve with a cracking pressure of 30-40 psi (2.1-2.8 bar) and capable of 4 gpm (15 lpm) minimum flow at the Discharge Outlet.

DEF-PMA models require a Non-Return Check Valve with a maximum cracking pressure of 3 psi (0.2 bar) between the product piping and the Bypass Relief Valve. Three-phase DEF-PMA models require overload protection in the motor starter, whereas single-phase DEF-PMA models have thermal overload protection built into the motor.

Conventions used in this manual

This manual includes safety precautions and other important information presented in the following format:

NOTE: This provides helpful supplementary information.

IMPORTANT: This provides instructions to avoid damaging hardware or a potential hazard to the environment, for example: fuel leakage from equipment that could harm the environment.

⚠ CAUTION: This indicates a potentially hazardous situation that could result in minor or moderate injury if not avoided. This may also be used to alert against unsafe practices.

⚠ WARNING: This indicates a potentially hazardous situation that could result in severe injury or death if not avoided.

⚠ DANGER: This indicates an imminently hazardous situation that will result in death if not avoided.

Operating precautions

Franklin Fueling Systems (FFS) equipment is designed to be installed in areas where volatile liquids such as gasoline and diesel fuel are present. Working in such a hazardous environment presents a risk of severe injury or death if you do not follow standard industry practices and the instructions in this manual. Before you work with or install the equipment this manual pertains to, or any other related equipment, read this entire manual, particularly the following:

⚠ CAUTION: Do not modify the DEF pump accessories. Modifying or altering these accessories in any way defeats the rigorous quality control tests performed during assembly and could result in dangerous safety issues.

⚠ WARNING: Follow all codes that govern how you install and service this product and the entire system. Always lock out and tag electrical circuit breakers while installing or servicing this equipment and related equipment. A potentially lethal electrical shock hazard and the possibility of an explosion or fire from a spark can result if the electrical circuit breakers are accidentally turned on while you are installing or servicing this product. Refer to this manual (and documentation for related equipment) for complete installation and safety information.

⚠ WARNING: Before you enter a containment sump, check for the presence of hydrocarbon vapors. Inhaling these vapors can make you dizzy or unconscious, and if ignited, they can explode and cause serious injury or death. Containment sumps are designed to trap hazardous liquid spills and prevent environmental contamination, so they can accumulate dangerous amounts of hydrocarbon vapors. Check the atmosphere in the sump regularly while you are working in it. If vapors reach unsafe levels, exit the sump and ventilate it with fresh air before you resume working. Always have another person standing by for assistance.

⚠ WARNING: Follow all federal, state, and local laws governing the installation of this product and its associated systems. When no other regulations apply, follow NFPA codes 30A and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage, and/or environmental contamination. Do not smoke while working on or near this equipment, and use only non-sparking tools.

⚠ WARNING: The piping and storage tank must be installed using standard industry practices, including, but not limited to:

- *Recommended Practices for Installation of Underground Storage Systems*, The Petroleum Equipment Institute, PEI/RP100 (latest edition).
- *Recommended Practices for Installation of Aboveground Storage Systems*, The Petroleum Equipment Institute, PEI/RP200 (latest edition).
- *Recommended Practices for the Storage and Dispensing of Diesel Exhaust Fluid (DEF)*, The Petroleum Equipment Institute, PEI/RP1100 (latest edition).

⚠ WARNING: Always secure the work area from moving vehicles. The equipment in this manual is usually mounted underground, so reduced visibility puts service personnel working on it in danger from moving vehicles that enter the work area. To help prevent this safety hazard, secure the area by using a service truck (or some other vehicle) to block access to the work area.

⚠ WARNING: Make sure you check the installation location for potential ignition sources such as radio waves, ionizing radiation, and ultrasound sonic waves. If you identify any potential ignition sources, you must make sure safety measure are implemented.

Questions and concerns

In case of emergency, follow the procedures established by your facility. If you have questions or concerns about safety or need assistance, use the information below to contact Franklin Fueling Systems:

Web: franklinfueling.com

Telephone:

USA and Canada: +1.608.838.8786, +1.800.225.9787

USA Technical Support: 1.800.984.6266

UK: +44 (0) 1473.243300

Mexico: 001.800.738.7610

France: +33 (0) 1.69.21.41.41

China: +86.10.8565.4566

Intentionally Blank

Installing DEF Pumping Accessories

When you install DEF Pumping Accessories, please keep the following in mind:

- Disconnect power to the DEF Pump Assembly at the electrical supply box prior to any service. Tag and lock out electrical circuit breakers so they are not turned on accidentally.

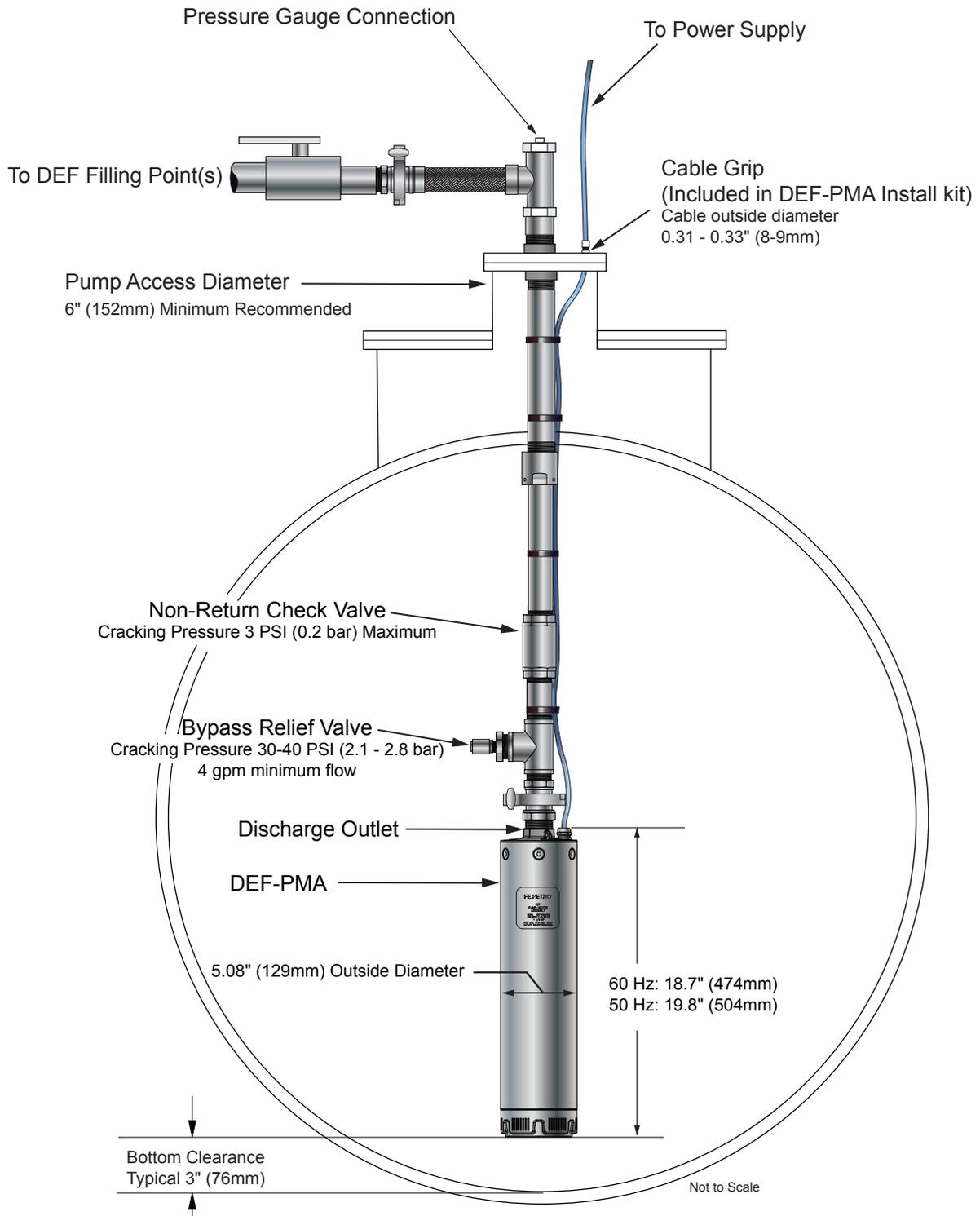
NOTE: Wiring for single phase units can include run/start capacitor. Make sure the capacitor is safely discharged before disconnecting supply wiring.

- Apply only DEF compatible thread sealant to all pipe thread connections. Pipe thread connections should be tightened to the following specifications:

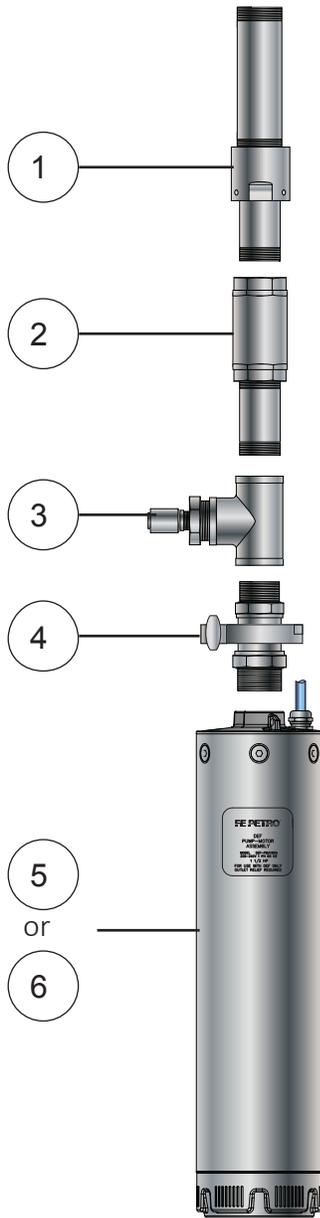
Pipe Thread Size	Minimum Torque Required	Tightening Reference
½" NPT	30 ft-lbs	1.5 - 3.0 turns past hand tight
1½" NPT	100 ft-lbs	1.0 - 2.5 turns past hand tight
2" NPT	150 ft-lbs	1.0 - 2.5 turns past hand tight

- Care should be taken when extracting and installing the DEF Pump Assembly to prevent component damage, including but not limited to the Power Cable of the DEF-PMA. Never lift or suspend the DEF Pump Assembly by the DEF-PMA Power Cable.
- ½" Bypass Relief Valve must be installed with the outlet pointed away from DEF-PMA Power Cable. Discharging the Bypass Relief Valve at the Power Cable could damage the jacket and the wiring inside.
- 1½" or 2" Non-Return Check Valve must be installed with flow direction arrow orientation from the DEF-PMA upward towards the top of the DEF Pump Assembly. If the Non-Return Check Valve orientation is not correct, the DEF Pump Assembly will not produce any flow.
- Do not over-tighten product piping into 2" NPT Discharge Outlet of DEF-PMA or irreparable damage could occur.
- Verify that the length of the DEF Pump Assembly will not touch the bottom of the tank. DEF-PMA will typically be suspended about 3" (76mm) off the bottom of the storage tank.
- Do not start DEF-PMA unless it has been completely submerged in fluid. Running the DEF-PMA without product to properly cooling the unit can cause irreparable damage.

Typical DEF-PMA installation



60 Hertz variable-length DEF-STP replacement kits



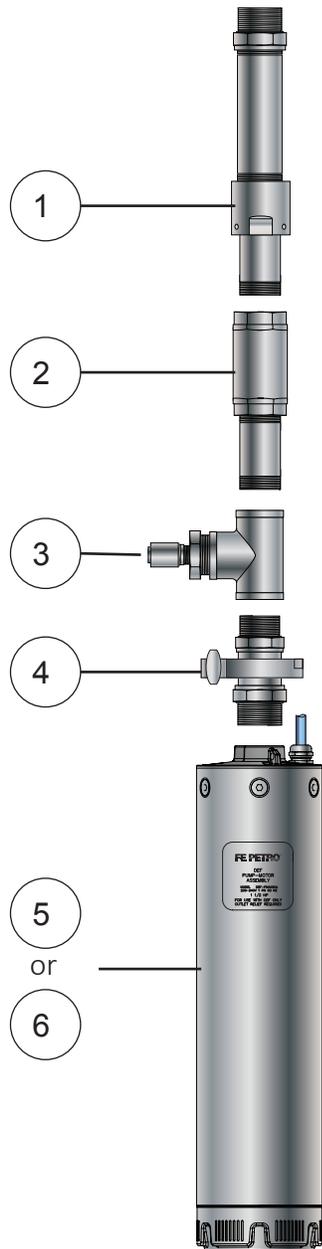
ITEM	MODEL	DESCRIPTION
1	N/A	Variable-length column pipe assembly (only available as part of complete DEF-STP Kits)
2	403463901	Check valve kit (includes 1½" NPT non-return check valve and 1½" NPT x 4" long nipple on inlet)
3	403461901	Bypass kit (includes ½" NPT bypass relief valve, ½" NPT x 1½" NPT bushing in 1½" NPT tee)
4	403454901	Pump motor assembly connection kit (includes 2" NPT male inlet x 1½" NPT male outlet EZ FIT® connection)
5	403383903	Single-phase Pump Motor Assembly (DEF-PMA150A)
6	403383933	Three-phase Pump Motor Assembly (DEF-PMA150D)

Note: Variable Length Column Pipe (item #1) reduces from 2" NPT at the top to 1½" NPT at the bottom connection to the Check Valve Kit.

Accessories and repair parts

MODEL	DESCRIPTION
400170936	Capacitor, 25 uF/370 V (for use with DEF-PMA150A)
400818921	Single-phase 208-240 volt pump control with 120 volt coil
401220903	Three-phase 208-240 volt pump control box with overload protection and 120 volt coil
403408931	1½" NPT non-return check valve (part of item #2, valve only)
403409931	½" NPT bypass relief valve (part of item #3, valve only)
403468901	DEF-PMA hardware pack (part of item #5 or #6, includes cable grip, cable ties, and documentation)

50 Hertz variable-length DEF-STP replacement kits



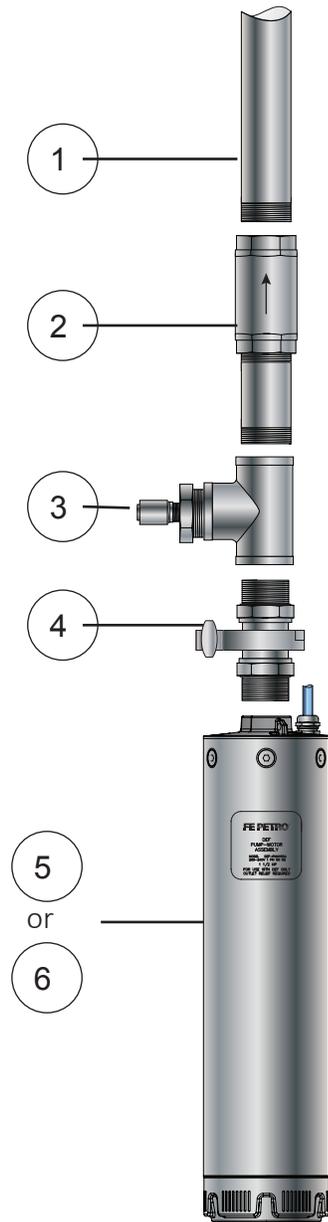
ITEM	MODEL	DESCRIPTION
1	N/A	Variable-length column pipe assembly (only available as part of complete DEF-STP kits)
2	403463901	Check valve kit (includes 1½" NPT non-return check valve and 1½" NPT x 4" long nipple on inlet)
3	403461901	Bypass kit (includes ½" NPT bypass relief valve, ½" NPT x 1½" NPT bushing in 1½" NPT tee)
4	403454901	Pump motor assembly connection kit (includes 2" NPT male inlet x 1½" NPT male outlet EZ FIT® connection)
5	403383953	Single-phase Pump Motor Assembly (DEF-PMA150B)
6	403383963	Three-phase Pump Motor Assembly (DEF-PMA150C)

NOTE: Variable Length Column Pipe (item #1) reduces from 2" NPT at the top to 1½" NPT at the bottom connection to the Check Valve Kit.

Accessories and repair parts

MODEL	DESCRIPTION
400170937	Capacitor, 30 uF/440 V (for use with DEF-PMA150B)
400818922	Single-phase 200-250 volt pump control with 240 volt coil
401220966	Three-phase 380-415 volt pump control box with overload protection and 240 volt coil
403459901	2" NPT female x 2" BSP male thread adapter (part of item #1, adapter only)
403408931	1½" NPT non-return check valve (part of item #2, valve only)
403409931	½" NPT bypass relief valve (part of item #3, valve only)
403468901	DEF-PMA hardware pack (part of item #5 or #6, includes cable grip, cable ties, and documentation)

60 Hertz fixed-length DEF submersible turbine pump kits

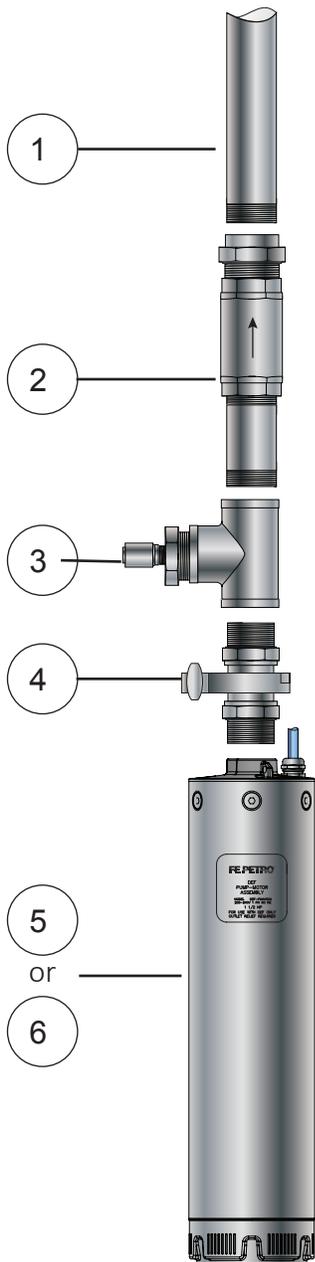


ITEM	MODEL	DESCRIPTION
1	N/A	Fixed-length column pipe, 2" NPT (locally supplied)
2	403464901	Check valve kit (includes 2" NPT non-return check valve and 2" NPT x 4" long nipple on inlet)
3	403462901	Bypass kit (includes 1/2" NPT bypass relief valve, 1/2" NPT x 2" NPT bushing in 2" NPT tee)
4	403456901	Pump motor assembly connection kit (includes 2" NPT male inlet x 2" NPT male outlet EZ FIT® connection)
5	403383903	60 Hz, single-phase pump motor assembly (DEF-PMA150A)
6	403383933	60 Hz, three-phase pump motor assembly (DEF-PMA150D)

Accessories and repair parts

MODEL	DESCRIPTION
400170936	Capacitor, 25 uF/370 V (for use with DEF-PMA150A)
400818921	Single-phase 208-240 volt pump control with 120 volt coil
401220903	Three-phase 208-240 volt pump control box with overload protection and 120 volt coil
403408932	2" NPT non-return check valve (part of component #2, valve only)
403409931	1/2" NPT bypass relief valve (part of component #3, valve only)
403468901	DEF-PMA hardware pack (part of components #5 or #6, includes cable grip, cable ties, and documentation)

50 Hertz fixed-length DEF submersible turbine pump kits



ITEM	MODEL	DESCRIPTION
1	N/A	Fixed-length column pipe, 2" NPT (locally supplied)
2	403464901	Check valve kit (includes 2" NPT non-return check valve and 2" NPT x 4" long nipple on inlet)
3	403462901	Bypass kit (includes ½" NPT bypass relief valve, ½" NPT x 2" NPT bushing in 2" NPT tee)
4	403456901	Pump motor assembly connection kit (includes 2" NPT male inlet x 2" NPT male outlet EZ FIT® connection)
5	403383903	60 Hz, single-phase pump motor assembly (DEF-PMA150A)
6	403383933	60 Hz, three-phase pump motor assembly (DEF-PMA150D)

Accessories and repair parts

MODEL	DESCRIPTION
400170936	Capacitor, 25 uF/370 V (for use with DEF-PMA150A)
400818921	Single-phase 208-240 volt pump control with 120 volt coil
401220903	Three-phase 208-240 volt pump control box with overload protection and 120 volt coil
403408932	2" NPT non-return check valve (part of component #2, valve only)
403409931	½" NPT bypass relief valve (part of component #3, valve only)
403468901	DEF-PMA hardware pack (part of components #5 or #6, includes cable grip, cable ties, and documentation)

Intentionally Blank



Franklin Fueling Systems

FE PETRO[®]

A Franklin Fueling Systems Brand

403414001 r3

